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Improvement Of Aodv Routing Protocol Based On Wireless Networks

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Abstract
For wireless networks has no support infrastructure and shows a highly dynamic feature, routing becomes a key problem to be solved. Data packets are transmitted on a path that had least hops in AODV protocol. It couldn't consider the path stability. When the node of wireless networks moved quickly and the path had short lifetime, the path recovery and routing again is caused. It is a lot of network resource. For network performance, AODV_V that improvement of AODV protocol in the paper. Opnet-11.5 simulation results show that AODV_V routing protocol can improve the delivery rate of data packets, reduce the average end to end delay and packet-loss-rate.

Keywords- wireless networks; AODV; Opnet-11.5

I. INTRODUCTION

Wireless networks (WN), whose communication distance is limited, if two disjoint nodes need communicate with each other, they have to rely on Intermediate network nodes to store and forward communications. Therefore, each node in WN not only plays as a host but also a router. Each node needs to establish a path before sending message. According to the way the path is built, WN routing protocols could be regarded as on-demand routing protocols and proactive routing protocols. The former one build its path based on the demands of data packet to be sent, the network topology and routing tables are created according to demand. Ad Hoc on Demand Distance Vector Routing Protocol (AODV) is a fine example of on-demand routing protocol. Proactive routing protocols, also known as table-driven routing protocols, each node in the network, whether communicate with other nodes or not, must maintain at least one table, which is used to record path information reach to all other nodes in the network. One of the typical proactive routing protocols is Destination-Sequenced Distance Vector routing protocol (DSDV). As wireless network is different from Ad Hoc network, there is much room for improvement to improve AODV routing protocol, which is appropriate for Ad Hoc, when applying it to. Meanwhile, AODV routing protocol is recommended By MANET (Mobile Networks) Working Group in the IETF (Internet Engineering Taskforce) for its simple, practical and effective features.

In most common METH, there are two kinds of nodes: one is stationary, the other is active. But the current routing protocol does not take this specific into account. This article proposes AODV_V routing protocol based on it. AODV_V Adopts driven table based on DSDV routing between stationary nodes. And it takes full advantage of the feature that table driven routing could fmd the route to destination node rapidly. Meanwhile, it avoids the rapid increase for routing expense, which is caused by frequent change of network topology of DSDV protocol. And it could be judged by communication hardware or manually that Whether a node is stationary. Most active nodes are limited on energy supply, and there is no stable power to provide sufficient energy, such as PDA, wireless sensor nodes, laptop etc. In AODV_V protocol, DSDV driven table on nodes will increase the complexity of processing data package, which will consume more energy as well. But for stationary nodes with stable energy supply, the overall performance of network will be promoted as AODV_V will reduce the break rate and the time delay between sending and receiving data package.

II. AODV PROTOCOL OVERVIEW

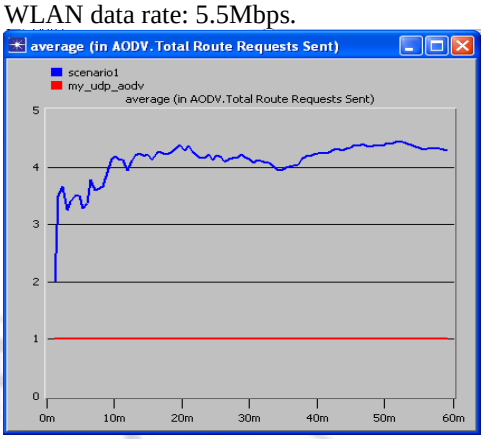
In the AODV protocol, when a network node (source node) needs to build to another node (destination node) routing, the source node broadcasts a route request message RREQ, the neighbour nodes using flooding to disseminateRREQ message. The process does not stop, unless the RREQ message reaches the destination node or reaches a middle of the node which has a certain cache reach to the destination node. According to the RREQ message received, intermediate nodes establish a temporary reverse route to reach the source node, while add a routing entry to the routing table. When the RREQ message reaches the destination node, or has reached a middle of the node which has a certain cache reach to the destination node, a route reply RREP messages in accordance with the reverse path of RREQ messages sent through the source node. intermediate CMCE 2010 nodes receiving the RREP message establish a

forward routing reaching to the destination node, and add a routing entry to the routing table. Each node on the path must periodically broadcast HELLO messages. The node discovers its neighbour nodes through receiving the HELLO messages other nodes broadcasted. When an outage occurs, the link, if the distance is less than the number of hops from the interruption link upstream node to the destination node, the interruption of the upstream node launches a local-link repair process. The node broadcasts RREQ packet to the destination node, while cache data, if given time, the routing is successful, the node will send cache the data to the destination node. If after a period of time without a valid route to send data, discard the data cached, send RERR packet to the source node, report routing failures, then the source node initiate re-route requests. DSDV -by-hop distance vector routing protocol, each node to maintain a routing table containing routing information to reach other nodes. The source node has data packets to be sent to another node, it can quickly choose to go to the purpose of node path. Meanwhile, according to each node periodically broadcast messages, it can update the routing table and accommodate the network topology changes, in general better convergence properties. AODV protocol only communicates when needed for routing, and routing nodes do not need unnecessary routing maintenance. As a result of the on-demand routing, nodes do not need to maintain routing information throughout the network, would be no need to periodically broadcast routing information. These can not only save a certain network resources, but also greatly reduce the processing memory and routing protocols overhead. However, the nodes in wireless network, not only are at rest, and more are in motion. In this time of the AODV routing, the data transmission faults often occur, leading to transmission delay, seriously affecting the agreement of performance. And the route reconstruction time is often relatively large.

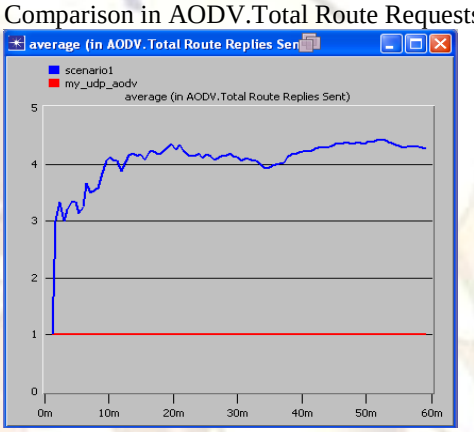
III.EFFORT OF IMPROVING AODV ROUTING PROTOCOL

I have done the comprehensive comparison of a wireless LAN with default and Improving AODV routing protocol. Network has 9 nodes with AODV routing. All nodes in the network are configured to run AODV. The results show the amount of routing traffic generated, the route discovery time. Simulation speed and results are influenced by Active Route Timeout, Hello Interval, Allowed Hello Loss, TTL parameter.

We have created two scenarios AODV D and AODV_v with the above configuration. In AODV D scenario we used the default AODV parameters and in AODV_V. we set following AODV parameters- Route Discovery Parameter: Enable, Active Route Hello Interval :uniform (15,15.1), Allowed TTL Parameter(TTL start) : 3, WLAN data rate: 5.5Mbps.



Comparison in AODV.Total Route Requests Sent



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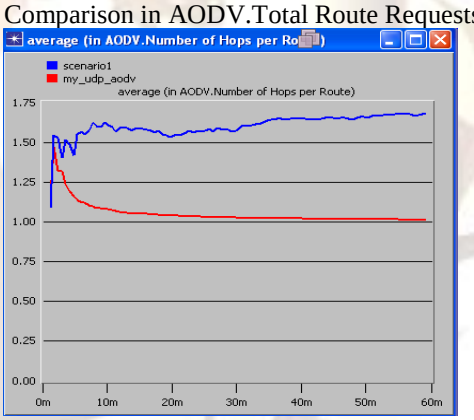
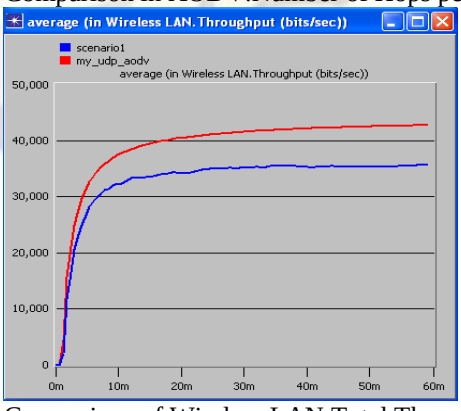


Comparison in AODV.Number of Hops per Route



Comparison of Wireless LAN Total Throughput.

IV CONCLUSION.

Following conclusion is made based on analysis of simulation results for UDP traffic in AODV network.

As a mobile node in MANET start moving all the route containing it changes and the source of each route has to search for new route by sending RREQ So, in the case of high mobility traffic of network increases.

We have did the comprehensive comparison of a wireless LAN with default and reduced routing traffic. Network has 9 nodes with AODV routing. All nodes in the network are configured to run. We conclude that,

By changing values of AODV parameters- Route Discovery Parameter: Enable, Active Route Hello Interval :uniform (15,15.1), Allowed TTL Parameter(TTL start) : 3, WLAN data rate: 5.5Mbpsreduced and hence the overall network load is reduced the total number of route request, reply, error, total number of reply from destination to source, reducing number of hope per route and increase Total Throughput of Wireless LAN.

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